CLAIMS

1. A process for producing a non-aqueous sol-gel spin-on glass material comprising a hybrid glass/polymer material by reacting an alkyl or dialkyl substituted trialkoxysilane or dialkoxysilane with a silane diol, wherein said alkyl group has from 1 to 8 carbon atoms.

2. The process of claim 1, wherein the silane diol is a diphenylsilanediol, a 1,3-Bis (3-hydroxypropyl)tetramethyldisiloxane, a 1,3-Bis (4-hydroxybutyl)tetramethyldisiloxane, a fluorinated silane diol, or a mixture of one or more of these silane diols.

3. The process of claim 1, wherein the alkyl group is replaced with a methacyloxypropyl, acryloxypropyl, or epoxy moiety.

4. The process of claim 1, wherein the trialkoxysilane or dialkoxysilane has one or more C_1 to C_8 alkyl, methacryloxypropyl and/or alkoxy groups on the same molecule.

5. The process of claim 1, wherein the trialkoxysilane or dialkoxysilane has 1 to 3 C_1 to C_8 alkyl, methacryloxypropyl and/or alkoxy groups on the same molecule.

6. The process of claim 1, further comprising adding an inorganic or organic dopant.

7. The process of claim 6, wherein the dopant comprises a phosphor dopant.

8. The process of claim 7, wherein the dopant comprises a YAG base phosphor, a moisture sensitive phosphor, nano-particles, or an organic material selected from organic dyes or metal complexes.

9. The process of claim 1, further comprising adding a UV light blocking material and/or an oxygen scavenger.

10. The process of claim 1, further comprising adding a light-scattering material.

11. The process of claim 1, further comprising adding a coupling agent.

12. The process of claim 11, wherein the coupling agent is a dibutoxyaluminoxytriethoxysilane, a mixture of zirconium isopropoxide and methacrylic acid, or another transition metal propoxide.

13. The process of claim 1, comprising the reaction of an alkoxy silane with an organic diol in a non-aqueous medium in the presence of a catalyst.

14. The process of claim 13, wherein the catalyst is a tin catalyst.

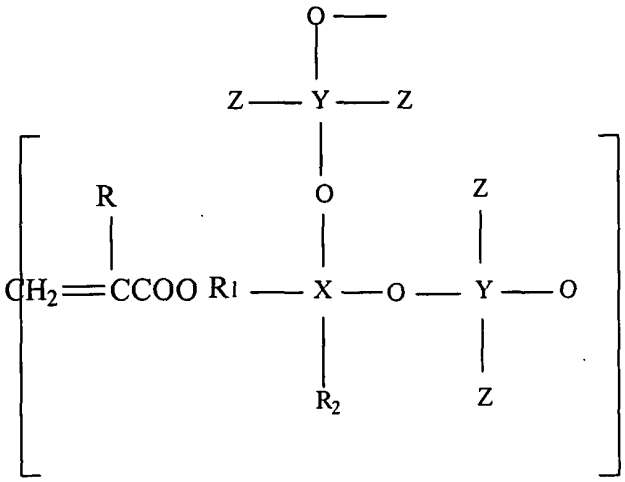
15. The process of claim 13, wherein the catalyst is dibutyltin diluarate, titanium isopropoxide, acetic acid or trifluroroacetic acid.

16. The process of claim 1, further comprising adding a coupling agent.

17. The process of claim 16, wherein the coupling agent is a dibutoxyaluminoxytriethoxysilane, a mixture of zirconium isopropoxide and methacrylic acid, or another transition metal propoxide.

18. A non-aqueous sol-gel spin-on glass material comprising a hybrid glass/polymer material selected from the group having the following formulas:

Formula I



Where **R**= Hydrogen, Alkyl, Halogenated Alkyl

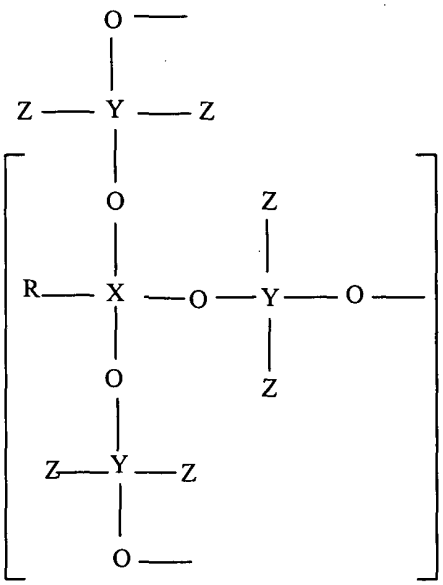
R_1= Alkyl, Halogenated Alkyl, Phenyl, Halogenated Phenyl

R_2= Alkyl, Methyl, Ethyl

X, Y= Si, Ge, Ti, Sn

Z= Alkyl, Substituted Alkyl. Phenyl, Substituted Phenyl

Formula II

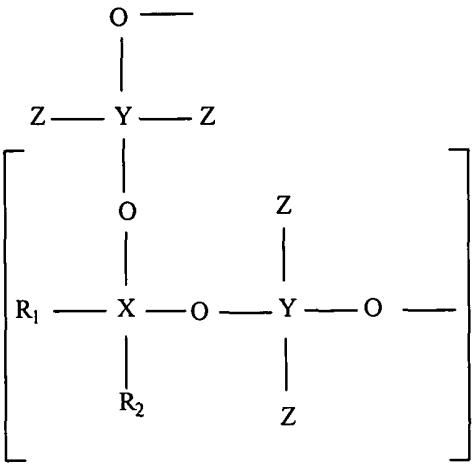


Where **R**= Alyl (C_1-C_8), Phenyl, Substituted Phenyl

X, Y= Si, Ti, Ge, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

Formula III



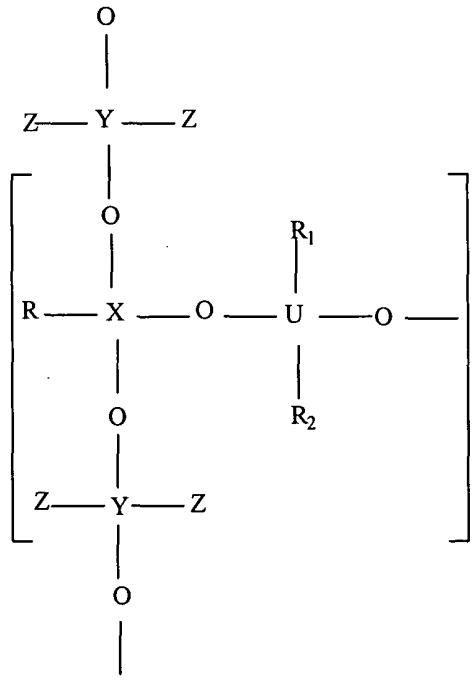
Where R_1= Phenyl, Ethyl, Propyl, Trifluoropropyl

R_2=Methyl, Ethyl

X, Y= Si, Ge, Ti, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

Formula IV



Where R= alkyl (C_1-C_8), phenyl, Substituted Phenyl

R_1= Alkyl, Phenyl,

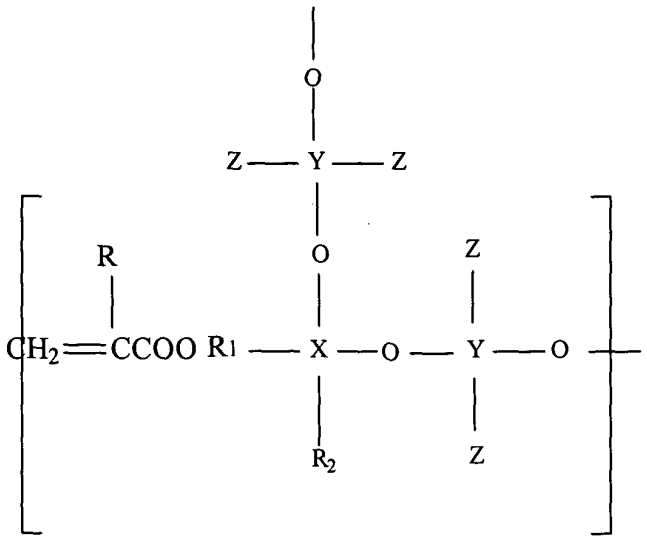
R_2= alkyl, Phenyl

X, U, Y= si, Ge, Ti, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

19. The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula I



Where **R**= Hydrogen, Alkyl, Halogenated Alkyl

$\mathbf{R_1}$= Alkyl, Halogenated Alkyl, Phenyl, Halogenated Phenyl

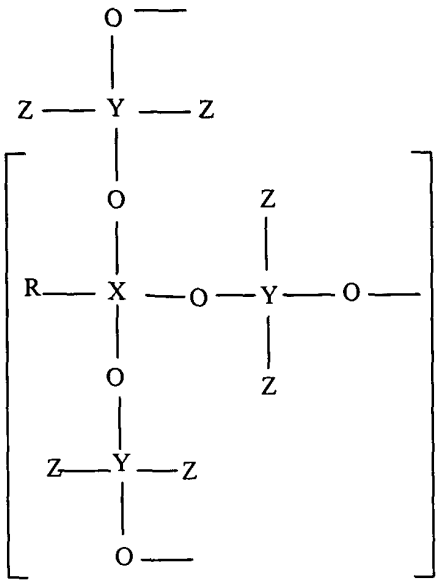
$\mathbf{R_2}$= Alkyl, Methyl, Ethyl

X, Y= Si, Ge, Ti, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted phenyl

20. The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula II



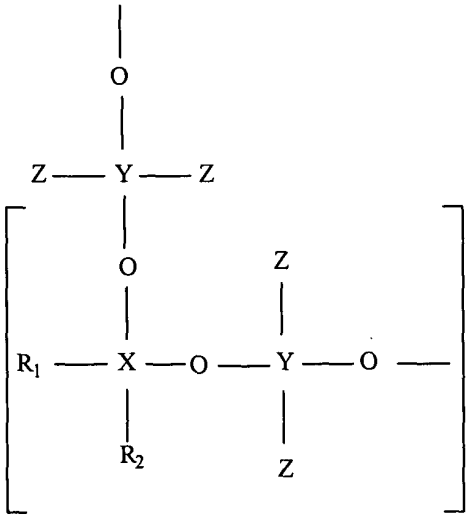
Where **R**= Alkyl, Substituted Alky, Phenyl, Substituted Phenyl

X, Y=Si, Ti, Ge, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

21. The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula III



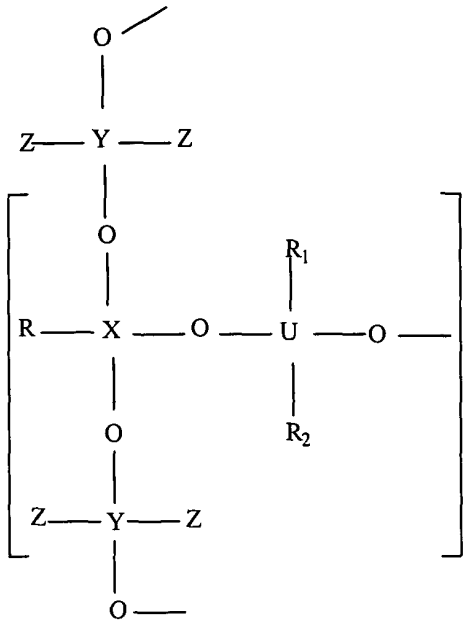
Where $\mathbf{R_1}$- Phenyl, Propyl, Ethyl, Trifluoropropyl

$\mathbf{R_2}$= Methyl, Ethyl

X, Y= Si, Ge, Ti, Sn

22. The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula IV



Where R_1= Alkyl (C_1-C_8), Phenyl, substituted phenyl

R_1= Alkyl, Phenyl

R_2= Alkyl Phenyl

X, U, Y= Si, Ge, Ti, Sn

Z= Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

23. The non-aqueous sol-gel spin-on glass material of claim 17, further comprising an inorganic or organic dopant.

24. The non-aqueous sol-gel spin-on glass material of claim 22, wherein the dopant comprises a phosphor dopant.

24. The non-aqueous sol-gel spin-on glass material of claim 22, wherein the dopant comprises a YAG base phosphor, a moisture sensitive phosphor, nano-particles, or an organic material such as an organic dye or a metal complex.

25. The non-aqueous sol-gel spin-on glass material of claim 17, further comprising a UV light blocking material and/or an oxygen scavenger.

26. The non-aqueous sol-gel spin-on glass material of claim 17, further comprising a light-scattering material.

27. A process for patterning the non-aqueous sol-gel spin-on glass material of claim 17 comprising: a) coating a substrate with said material followed by soft baking at 110°C (1hr), 120°C (1-2 hr); b) exposing the coated substrate of step a) to UV illumination in a desired pattern; c) post-exposure baking the coated substrate of step b) at a temperature from 100°C to 120°C for 30 to 60 minutes; d) cooling the coated substrate of step c) to room temperature; e) removing the non-exposed areas of the coating on the coated substrate of step d); f) drying the coated substrate of step e); g) hard baking the coated substrate of step f) at a temperature from 120 °C and 150 °C for 1 to 3 hours.

28. The process of claim 27, wherein the non-exposed areas of the coating on the coated substrate are removed by developing in a suitable organic solvent.

29. The process of claim 28, wherein in step e) the organic solvent is tetrahydrofuran, methylethylketone, acetone, n-propylacetate, or mixture of these solvents.

30. The process of claim 27, wherein in step f) the coated substrate is dried by flushing with a non-reactive gas.

31. The process of claim 27, wherein in step a) the substrate is glass, quartz, sapphire, silicon, a metalized substrate or a polymeric film.

32. The process of claim 27, wherein in step a) the coating is carried out by spin coating, dip coating, spray coating or doctor blade coating.